

IN THE SPECIFICATION

Please amend the 3rd paragraph right after "Summary of Invention" on page 5 of the amended Specification filed in the Response dated 7/31/2004:

The present invention pertains to new designs of CMOS image sensors. According to one aspect of the present invention, the substrate traditionally used in the CMOS process is a same doping type of an EPI layer and replaced by a substrate that is of different doping type of the EPI layer, leading to layers on top of each other. When two different voltages are applied respectively to the EPI layer and the substrate two layers, the substrate causes to form a reversely biased junction is formed between the two layers so as to form a potential barrier under a photo diode. The potential barrier prevents noise electrons diffusing from the a substrate layer (e.g., the lower one of the two layers) to the photo diode. According to another aspect of the present invention, a deep well with the same type of the EPI layer is implanted in the EPI layer to prevent latch-up between wells and the substrate. According to still another aspect of the present invention, the distance between a micro lens and a corresponding photodiode is reduced by adding an extra CMP step after a last oxide layer deposition.